Digital Station Description and Digital CNC Description for IEC/IEEE 60802

Data Set Format and File Format

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5.5.5 Common Requirements for Digital Station Description

IA-Station of any conformance class for which a claim of conformance to the TSN-IA Profile is made shall:

a) support the delivery of YANG instance data of all YANG modules that are present in the local database in the form of an XML file

b) support the format of the instance data set as defined in the RFC 9195 – "A File Format for YANG Instance Data"

6.7.9.2 Digital Station Description

Both engineering models, offline via an engineering tool and online with plug & produce by the CNC, require information about the capabilities of an IA station.

This information is described as a YANG module and provided in the local database of the IA-station.

To provide the identical information, the YANG module is also available in the form of a Digital Station Description (data sheet of an IA-station).

From the point of view of the hardware of an IA station, the Digital Station Description of an IA station is the description of the IA-station portion of a product.

However, as soon as the application of this product is configured, there may be restrictions on the IA-station portion that result in a Digital Station Description for this instance of the product.

The digital data sheet of the IA-Station provides a collection of instantiated data nodes of all YANG modules that are present in the local database of the IA-Station. This includes all YANG modules required by this profile, as well as all additional modules that have been added by the vendor. The data sheet contains a single instance data set and no additional data. It carries complete configuration and state data of each YANG module that is present in the local database of the IA station. The identity of the datastore with which the instance data set is associated is reported. The format of the YANG instance data set is defined in RFC 9195. The file format is based on the XML encoding. It is created by applying the respective XML encoding rules for the YANG structure of the YANG module mentioned above.

Identified gap: The YANG module that models the device capabilities and quantities (e.g. forwarding delays or the number of supported sync trees) is missing. A contribution is being prepared.

6.7.9.3 Digital CNC Description

The features of a CNC need to be available for offline and online engineering or diagnosis.

For this purpose, a YANG module is used that allows structured access to the local database of the CNC. To provide this data also offline, the YANG model including the data is also provided as a file.

Any IA-Station can include a CNC entity in which case the collection of YANG modules of such IA-Station would include all CNC specific YANG modules e.g., the e ieee802-dot1dj-tsn-config-uni YANG module. Since all IA-Stations meet the requirements from 5.5.5., the CNC related YANG instance data is automatically included in the digital data sheet of the IA-Station (as described in 6.7.9.2.) that hosts the CNC. See 6.7.9.2.

Chassis

IA-station

End station component 2

End station component 3

IA-device 2

IA-controller 1

IA-controller 2

Management Entity

<operational> DS

Instantiated YANG modules from 6.7.10

RFC 9195

Digital Data Sheet
A single YANG Instance Data File (XML)

Functional Unit 1

Functional Unit 2

Functional Unit 3

ESC1-IP1

Internal LAN

BC1-IP3

Bridge component 1

ESC2-IP1

Internal LAN

BC2-IP3

Bridge component 2

CNC

BC1-P1

X1P1

BC1-P2

X1P2

BC2-P1

X2P1

BC2-P2

X2P2

ESC3-P1

X3P1

ESCx = end station component x   Px = Port x
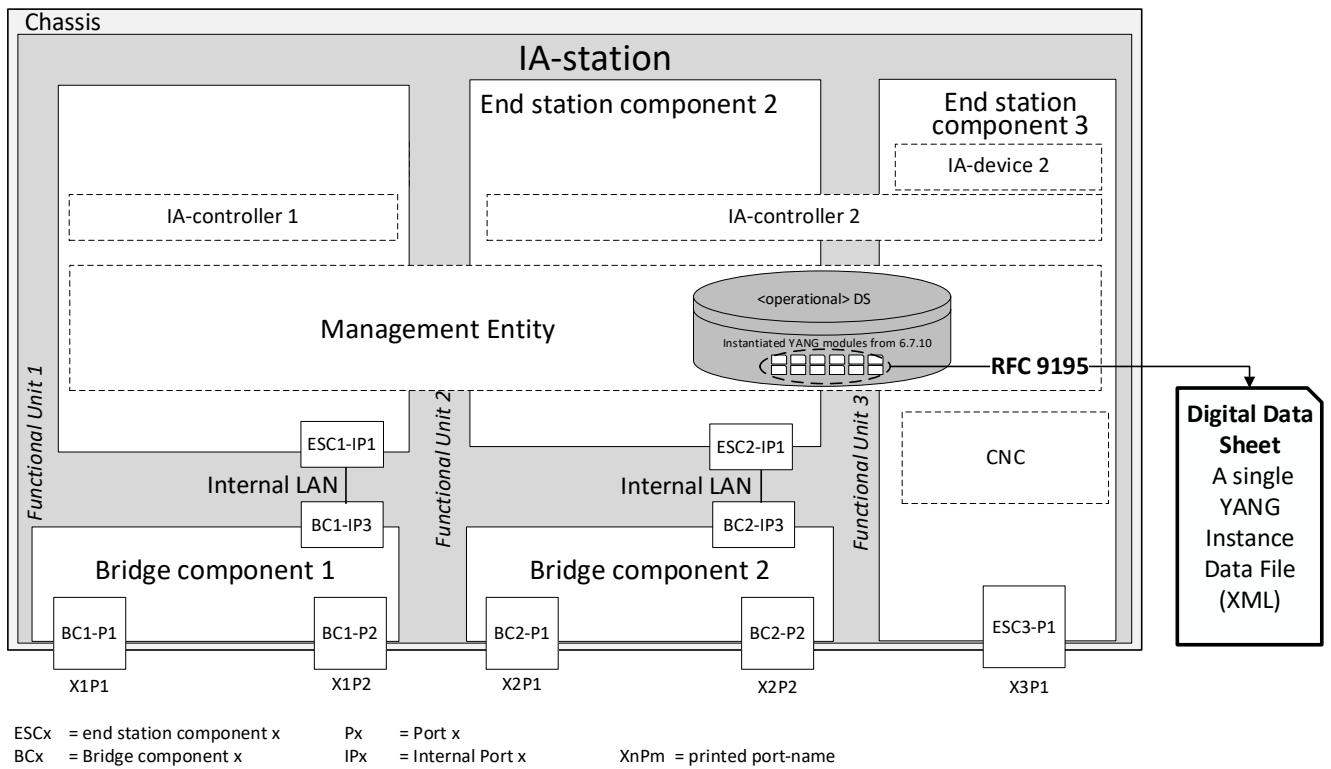BCx = Bridge component x   IPx = Internal Port x   XnPm = printed port-name

Figure 29: Creation of the digital data sheet of an IA-Station